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09/924,464	08/09/2001	Hiroshi Sotozaki	2001-1104A	2928

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WENDEROTH, LIND & PONACK, L.L.P.
2033 K STREET N. W.
SUITE 800
WASHINGTON, DC 20006-1021

EXAMINER

BALSIS, SHAY L

ART UNIT

PAPER NUMBER

1744

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/924,464

Applicant(s)

SOTOZAKI ET AL.

Examiner

Shay L Balsis

Art Unit

1744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

The specification is objected to because of the following informalities:

Page 4, line 22 should read "A fifth aspect of the invention..."

Page 5, line 6 should read "A sixth aspect of the invention..."

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 17-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Ziemins et al. (USPN 6622334).

Ziemins teaches a substrate cleaning apparatus comprising a pair of bases (22) movable to come closer to or to go away from. There is a plurality of rollers (24, 28) to grip the periphery of a substrate. One of the rollers is a substrate rotating mechanism (24) that is operable to rotate the rollers thereby rotating the substrate. The other roller is a scrub-cleaning member (28) that is adapted to clean the end face of a substrate. The substrate rotating mechanism causes the substrate to rotate which in turn causes the cleaning member to rotate. There is additionally an ultrasonic cleaning nozzle (not shown, col. 4, lines 64-67) for directing liquid to the edges of the substrate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moinpour et al. (USPN 6334229) in view of Jones et al. (USPN 6427566).

Moinpour teaches a substrate cleaner comprising a cleaning roller (330) and a drive roller (331). Both rollers grip the periphery of the substrate and both aid in rotating the substrate. The cleaning roller is adapted to rotate and be brought in contact with an end face of a substrate to perform scrub-cleaning to the end face. There is a power transmission (340 and belt not labeled) for transmitting a rotational force to each of the rollers. The rollers both rotate at different revolutions causing a ratio of rotational speeds. The difference between rotational speed of the roller and substrate is used to clean the edge of the substrate (col. 4, lines 1-9). The cleaning roller includes a pad (401) made of an abrasive material to effectively clean the edge of the substrate. There is a cleaning nozzle for injecting a cleaning liquid against a surface of the cleaning member. Moinpour teaches all the essential elements of the claimed invention however fails to teach that the power transmission transmits a rotating force for rotating the substrate to the cleaning roller so as to rotate the cleaning roller. Moinpour teaches two rollers each attached to a separate motor.

Jones teaches a substrate cleaner comprising two edge rollers (6) with two embodiments for rotating the rollers. The first embodiment is where each edge roller is connected to a separate

motor (66) and second embodiment is where each roller can be controlled by a single motor with a power transmission such as a belt or gear transmission to provide rotational power to the drive arms (col. 9, lines 34-47). Moinpour teaches essentially the same control unit as the first embodiment of Jones, where each roller has a separate motor. Jones teaches that the first embodiment and second embodiment are interchangeable and can achieve the same result. When using a motor with a gearing system to control two rollers, each rotating at different speeds, it is known in the mechanical industry to use gears of different sizes to achieve the ratio of rotation needed. Therefore, it would have been obvious to one of ordinary skill in the art to use Jones' second embodiment instead of the first embodiment on Moinpour's invention since they are known to be equivalent structures and systems.

Claims 1-3, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krusell et al. (USPN 6594847) in view of Jones et al. (USPN 6427566).

Krusell teaches a substrate cleaner comprising a cleaning roller (106b) and a drive roller (106a). Both rollers grip the periphery of the substrate and both aid in rotating the substrate. The cleaning roller is adapted to rotate and be brought in contact with an end face of a substrate to perform scrub-cleaning to the end face. There is a power transmission (108a, 108b, 110a, 110b) for transmitting a rotational force to each of the rollers. The rollers both rotate at different revolutions causing a ratio of rotational speeds. The difference between rotational speed of the roller and substrate is used to clean the edge of the substrate (col. 4, lines 44-60). The cleaning roller includes a pad (150) made of an abrasive material to effectively clean the edge of the substrate. There is a cleaning nozzle (230a, 230b) for injecting a cleaning liquid against a surface of the cleaning member. Krusell teaches all the essential elements of the claimed

invention however fails to teach that the power transmission transmits a rotating force for rotating the substrate to the cleaning roller so as to rotate the cleaning roller. Krusell teaches two rollers each attached to a separate motor.

Jones teaches a substrate cleaner comprising two edge rollers (6) with two embodiments for rotating the rollers. The first embodiment is where each edge roller is connected to a separate motor (66) and second embodiment is where each roller can be controlled by a single motor with a power transmission such as a belt or gear transmission to provide rotational power to the drive arms (col. 9, lines 34-47). Krusell teaches essentially the same control unit as the first embodiment of Jones, where each roller has a separate motor. Jones teaches that the first embodiment and second embodiment are interchangeable and can achieve the same result. When using a motor with a gearing system to control two rollers, each rotating at different speeds, it is known in the mechanical industry to use gears of different sizes to achieve the ratio of rotation needed. Therefore, it would have been obvious to one of ordinary skill in the art to use Jones' second embodiment instead of the first embodiment on Krusell's invention since they are known to be equivalent structures and systems.

Claims 4-5, 8-9, 11, 12, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moinpour et al. (USPN 6334229) in view of Jones et al. (USPN 6427566) as applied to claims 1-3 and 7 above, in further view of Ziemins et al. (USPN 6622334).

Moinpour in view of Jones teaches all the essential elements of the claimed invention however fails to teach a force adjusting mechanism and a swingable swing arm for supporting the cleaning roller. Ziemins teaches a force-adjusting arm (22) for adjusting the amount of pushing of the cleaning member on the edge of the substrate. Additionally, Ziemins teaches that

the cleaning roller is located on the free end of a swing arm biased in the direction of the substrate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to allow Moinpour's cleaning roller to be swung outward and biased or forced inward toward the substrate to allow for easy loading, removal and securement of the substrate before, during and after the cleaning process.

Claims 4-5, 8-9, 11, 12, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krusell et al. (USPN 6594847) in view of Jones et al. (USPN 6427566) as applied to claims 1-3 and 7 above, in further in view of Ziemins et al. (USPN 6622334).

Krusell in view of Jones teaches all the essential elements of the claimed invention however fails to teach a force adjusting mechanism and a swingable swing arm for supporting the cleaning roller. Ziemins teaches a force-adjusting arm (22) for adjusting the amount of pushing of the cleaning member on the edge of the substrate. Additionally, Ziemins teaches that the cleaning roller is located on the free end of a swing arm biased in the direction of the substrate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to allow Krusell's cleaning roller to be swung outward and biased or forced inward toward the substrate to allow for easy loading, removal and securement of the substrate before, during and after the cleaning process.

Claims 6, 10, 13, 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moinpour et al. (USPN 6622334) in view of Jones et al. (USPN 6427566) as applied to claims 1-3 and 7 above, further in view of Ziemins et al. (USPN 6622334) as applied to claims 4-5, 8-9, 11, 12 and 14 above and additionally further in view of Bliven et al. (USPN 6439245).

Moinpour in view of Jones as well as Moinpour in view of Jones in view of Ziemins all teach the essential elements of the claimed invention however the references fail to teach a vertical height adjusting mechanism for adjusting the vertical height of the cleaning roller to correspond the height of the substrate. Bliven teaches a substrate cleaner comprising edge cleaning rollers (202a, 202b). These edge rollers are adjustable in height by adjusting the height adjustment knobs (208a, 208b). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a height adjustment knob on Moinpour's invention to ensure that the cleaning roller and the substrate are at the same height. By adjusting the height of the cleaning roller so that the substrate will fit directly into the groove, allows for a proper and effective cleaning of the edges. Additionally, the proper placement of the roller will prevent premature wearing of the roller as well as the substrate.

Claims 6, 10, 13, 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krusell et al. (USPN 6594847) in view of Jones et al. (USPN 6427566) as applied to claims 1-3 and 7 above, further in view of Ziemins et al. (USPN 6622334) as applied to claims 4-5, 8-9, 11, 12 and 14 above and additionally further in view of Bliven et al. (USPN 6439245).

Krusell in view of Jones as well as Krusell in view of Jones in view of Ziemins all teach the essential elements of the claimed invention however the references fail to teach a vertical height adjusting mechanism for adjusting the vertical height of the cleaning roller to correspond the height of the substrate. Bliven teaches a substrate cleaner comprising edge cleaning rollers (202a, 202b). These edge rollers are adjustable in height by adjusting the height adjustment knobs (208a, 208b). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a height adjustment knob on Krusell's invention to ensure that

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the cleaning roller and the substrate are at the same height. By adjusting the height of the cleaning roller so that the substrate will fit directly into the groove, allows for a proper and effective cleaning of the edges. Additionally, the proper placement of the roller will prevent premature wearing of the roller as well as the substrate.

Claims 1-4, 6-8, 10, 12-13, 15-16, 17-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yashiki et al. (USPN 6041465) in view of Gockel et al. (USPN 6119295).

Yashiki teaches a substrate cleaning device comprising a plurality of substrate rotating rollers (12) for rotating the substrate and cleaning rollers (12) for cleaning the edge of the substrate. Since there are three rollers, the examiner is considering one of the rollers to be a cleaning roller since there are circumferential grooves (14) that are formed by a polyurethane foam (col. 10, lines 35-36). It is known in the art to use polyurethane foam as a substrate edge cleaner. There is a power transmission mechanism (13) for transmitting a rotating force from the rotating rollers to the cleaning roller. There is a nozzle (5-1, 5-2) for injecting a cleaning liquid against a surface of the substrate. There is a force adjusting mechanism (16) for biasing the cleaning member against the edge of the substrate. There are multiple grooves on the rollers that act as a contact location adjusting mechanism for adjusting the vertical placement of the substrate (figure 11 and figure 15). Yashiki teaches all the essential elements of the claimed invention however fails to teach that the rollers and the substrates rotate at different speeds. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use gears of different sizes and ratios so that each roller could operate at different revolutions to increase the effectiveness of the edge cleaners (col. 10, lines 4-10).

Applicant's Arguments

1. Ziemins, Yashiki and Frey all fail to teach a power transmission mechanism.
2. Ziemins fails to teach that the peripheral velocity of the wafer is different than the peripheral velocity of revolution of the drive wheels.
3. Yashiki does not disclose that the rollers are capable of cleaning.
4. Frey does not teach edge cleaners but upper and lower surface cleaners.
5. Sawada fails to teach a scrub-cleaning member to clean the edges of a substrate.

Response to Arguments

Applicant's arguments labeled 2, 4-5 above have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. Ziemins fails to teach differing velocities between the substrate and the cleaning roller. Additionally, Frey and Sawada both fail to teach edge cleaners.

Applicant's arguments labeled 1 and 3 above have been fully considered and are not persuasive. All three references, Ziemins, Yashiki and Frey all teach power transmission by either a motor, gears or belts however the references fail to teach differing velocities between the substrate and the cleaning roller. Therefore the 102 rejections of Ziemins, Yashiki and Frey have been withdrawn with regards to claim 1 and the limitation that the velocity between the substrate and cleaning roller must be different. Yashiki does teach that the rollers are capable of cleaning. Yashiki teaches that the roller can be made of polyurethane foam, which has a high frictional coefficient. Having a high friction coefficient will clean the edges of the substrate. This is known in the art since many cleaning rollers add an abrasive material to the inside grooves to aid in cleaning substrate edges.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

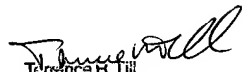
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shay L Balsis whose telephone number is 571-272-1268. The examiner can normally be reached on 7:30-5:00 M-Th, alternating F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Warden can be reached on 571-272-1281. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Slb
6/4/04


Terrence H. Till
Primary Examiner